United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Seed and Plant Introduction and Distribution,

WASHINGTON, D. C.

IRON COWPEA.

(*A variety resistant to wilt and root-knot.*)

HISTORY.

The Iron cowpea is a variety especially adapted for soil renovation and forage purposes on land where other varieties fail to succeed because of the attacks of wilt, root-knot, and other soil parasites. The seed sent out in two-quart packages accompanying this circular is grown expressly for the Department of Agriculture and is distributed in the Southern States primarily to test its resistance to the diseases mentioned above, which cause the condition of land commonly known as "pea-sickness." In localities where no disease occurs it should be tested for hardiness, resistance to drought and weevils, and general value.

The origin of the iron cowpea is uncertain. It was found in cultivation in Barnwell and Aiken counties, S. C., and its remarkable resistance to disease was demonstrated by experiments made by the Department of Agriculture in 1900–2 on the farm of Mr. T. S. Williams, Monetta, S. C., where the seed now distributed was grown. It was tested on land infested with both wilt and root-knot in comparison with over forty other varieties, all of which were wholly or partially destroyed by disease, while the Iron variety remained healthy. A photograph of this field is shown in Plate I, fig. 1. The Speckled cowpea on the right was treated in every respect like the Iron, but was unable to withstand the disease. In all our trials in South Carolina the Iron cowpea has remained free from nematode attacks, but at the Florida Experiment Station it was somewhat affected. It should be understood that under varying conditions different results may be expected, and this variety may not everywhere prove as resistant as in South Carolina. One object of this distribution of the Iron cowpea is to determine its resistance to disease under varying climatic and soil conditions and its suitability for different sections.

CHARACTERS OF THE IRON COWPEA.

The Iron cowpea is of the Clay type. The seeds are small and hard; color buff, of varying shades. The plant is vigorous, erect, or half-trailing; the leaves dark green, with a distinctive bluish luster; time of maturing, medium to late. It blooms and bears continuously through the season, but the pods do not shell out in the field as freely as other sorts. An especially noteworthy feature is that it holds its leaves late in the season, remaining green after other late kinds are dead. It resists the attacks of the wilt fungus and nematode worm, withstands drought well, and the hard seeds are very free from weevil attacks. The seeds will live through the winter in the ground and come up in the spring more freely than any other variety tested. It is reported to be of fair quality as a table pea.

The Iron cowpea will be most valuable for soil improvement and forage where other kinds fail. On healthy soils it is doubtful whether it will replace existing standard varieties, as it is no more productive than many others. Its long bearing season is a fault, making harvesting more difficult.

DIRECTIONS FOR PLANTING.

In order to test the disease-resistant qualities of this cowpea it should be planted on land where the ordinary varieties do not grow well, if any such is available. For the purpose of comparison, a few rows of another variety should be planted beside it. The methods of planting and cultivation should be the same as for the common varieties. To secure a good crop of seed, plant from May 20 to July 10, according to the latitude, in drills 3 to 4 feet apart, at the rate of 2 pecks per acre.

DISEASES OF THE COWPEA.

The Iron cowpea is most noteworthy for its resistance to the cowpea wilt disease and root-knot. A full description of these diseases, with accounts of experiments with remedies, etc., is published in Bulletin No. 17, Bureau of Plant Industry, United States Department of Agriculture, and will be sent free on request. A brief account is given here to enable the farmer to recognize these troubles.

THE COWPEA WILT.

The wilt of the cowpea is common only on light or sandy soils, and occurs principally on land where cowpeas have been grown for several years. It appears about August in spots of varying size, which spread gradually over the field. The plants in these areas turn yellow, lose their leaves, and die. The stems have a reddish-brown tinge, and, when broken, the inside will also be found discolored. Later, these stems become covered with the light-pink spores of the fungus which causes the disease. This fungus enters the roots from

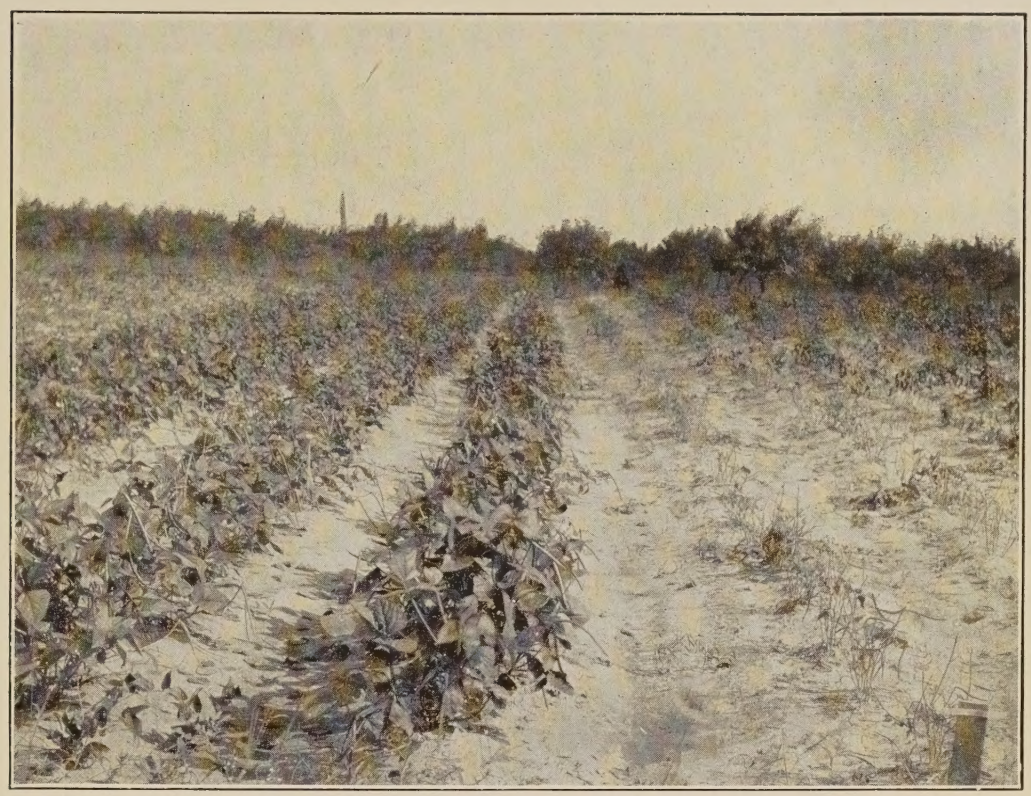

FIG. 1.—FIELD INFECTED BY WILT AND ROOT-KNOT.

Iron cowpea, resistant; Speckled cowpea, killed.

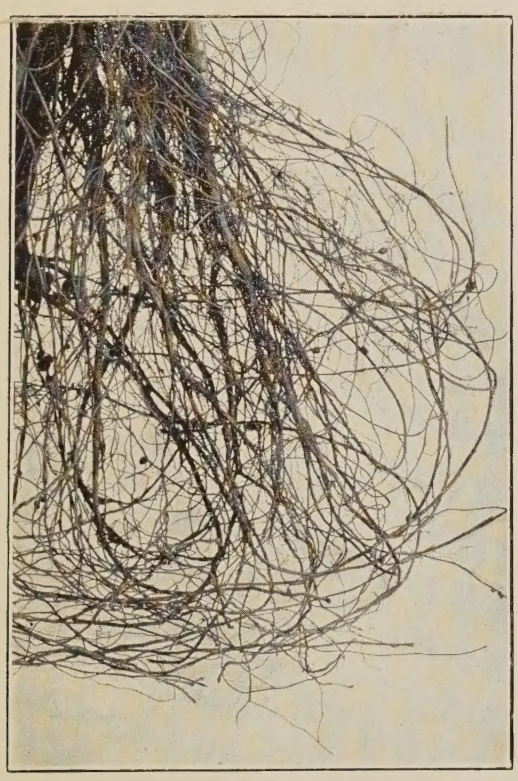

FIG. 2.—ROOTS OF IRON COWPEA.

FIG. 3.—ROOT-KNOT ON WONDERFUL COWPEA.

From adjoining rows in the same field.

the soil and, growing upward, fills the water-carrying vessels of the stem with its threads, thus shutting off the water supply and causing the death of the plant.

Remedies.—The cultivation of the Iron pea is the best means of relief, as it will grow where all other kinds fail. Rotation of crops for two years will give temporary relief, or, since the disease does not attack any other crop than the cowpea, velvet beans or other legumes may be substituted.

ROOT-KNOT.

Root-knot, like the wilt, is most injurious on sandy soil, and the two diseases are often found occurring together. It is caused by a minute nematode, or eelworm, which enters the roots and produces large, irregular swellings or galls. These very injurious enlargements should not be confused with the bacterial tubercles found on all healthy cowpea roots. The latter are small and regular in form and greatly benefit the plant by enabling it to draw nitrogen from the air. The accompanying figures illustrate this distinction. A few bacterial tubercles appear on the healthy roots in Plate I, fig. 2, while the roots in fig. 3 are deformed by root-knot.

Root-knot is also produced on several other plants by the same nematode that attacks cowpeas. Cotton, okra, peaches, and most garden vegetables are greatly injured by it. This is the most serious feature of the disease, since the cultivation of the ordinary varieties of cowpea on nematode-infected land so greatly increases the number of the parasites in the soil that succeeding cotton or other crops are much injured.

Remedies.—It is hoped that work now in progress in the Department of Agriculture will result in the breeding of varieties of cotton, peaches, etc., which will be resistant to root-knot. At present no remedy is known that will entirely free land in our Southern States from this disease. The sterilization of the soil by heat or toxic chemicals, clean fallowing, etc., have been recommended, but the best that can be done in ordinary farm practice is to adopt a rotation designed to starve out the parasites by growing a succession of immune crops, such as the Iron cowpea, beggarweed, corn, oats, or other grains, grasses, etc. A rotation like the following is suggested for cotton planters: First year, corn, with Iron cowpeas between the rows; second year, either beggarweed, velvet beans, or oats followed by Iron cowpeas; third year, cotton. If necessary, cotton might also be planted the fourth year, after which the rotation should be repeated.

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Approved:
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REPORT RESULTS.

It is desired to know the results of all trials of the Iron cowpea, and every farmer who receives seed is requested to return the accompanying card with his name and address, signifying his willingness to report at the end of the season. Blanks will then be sent out to be filled and returned. A report will be asked for on the character of soil, whether or not infested with wilt or nematodes, manner of planting, character of season, success as a forage crop, yield as compared with other varieties, resistance to disease, etc.

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